

**METHOD AND SYSTEM OF QUANTITATIVELY ASSESSING DIFFUSION
CHARACTERISTICS IN A TISSUE**

ABSTRACT

A process and system to implement such a process is configured to determine diffusion properties within a region-of-interest. A metric or index of diffusion is determined from individual diffusion values corresponding to diffusion along multiple diffusion directions relative to average diffusion at a related voxel or pair of voxels. The invention may be implemented to determine shared diffusion anisotropy between two voxels. Based on a value of a diffusion index or metric, the present invention provides an efficient and tensor-free technique of determining if diffusion in neighboring voxels is anisotropic and if the diffusion is oriented in the same direction within each voxel. The present invention may be used to rapidly determine fractional anisotropy in a single voxel or used to filter diffusion weighted imaging data. The present invention may also be used to color-code diffusion data such that diffusion and tract orientation are readily identifiable in a reconstructed image.